



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 150  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,204	02/17/2004	Vadim Shapiro	P07676US00	9917
22885 7590 12/18/2006 MCKEE, VOORHEES & SEASE, P.L.C. 801 GRAND AVENUE SUITE 3200 DES MOINES, IA 50309-2721			EXAMINER NORTON, JENNIFER L	
			ART UNIT 2121	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			12/18/2006	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/780,204

Applicant(s)

SHAPIRO ET AL.

Examiner

Jennifer L. Norton

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The following is a **Final Office Action** in response to the Amendment received on 25 September 2006. Claims 1 and 9 been amended. Claim 17 has been newly added. Claims 1-17 are pending in this application.

#### ***Claim Rejections - 35 USC § 112***

2. The amendment to the Claims was received on September 25, 2006. The corrections are acceptable and the rejections to the claims are withdrawn.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 7-10, 12-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,901,300 (hereinafter Blevins) in view of U.S. Patent No. 4,823,299 (hereinafter Chang).

Art Unit: 2121

2. As per claim 1, Blevins teaches to a method for controlling a controlled operation by determining a lag in measured data from at least one variable signal, comprising:

processing the measured data using time-series analysis with a filter to produce filtered data with reduced noise content (col. 4, lines 29-34, col. 10, lines 13-16 and Fig. 3, element 60);

arranging the filtered data in matrices with one column for each variable signal (col. 9, lines 55-58 and Fig. 3, element 53);

processing data with a variable signal estimator to output a variable signal function for each variable signal that defines each variable signal in terms of its mathematical dependencies on all of the variable signals (col. 10, lines 6-9 and 43-48);

processing each variable signal function with a criterial function to provide an optimal lag value for each variable signal (col. 9, lines 66-67, col. 10, lines 1-3, col. 12, lines 65-67 and col. 13, lines 1-10);

processing data with a lag estimator to output a lag function for each lag, each lag function defining each lag in terms of its mathematical dependency on all of the variable signals (col. 13, lines 30-38);

determining the goodness of fit of each lag function based on the most recent filtered data (col. 16, lines 56-67);

storing at least one lag function based on its goodness of fit (col. 17, lines 16-17); and

discarding at least one lag function based on its goodness of fit (col. 17, lines 4-16).

Blevins does not expressly teach to shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal and processing each shifted matrix with a point calculation algorithm to produce a point for each column in each shifted matrix

Chang teaches to shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the data for each variable signal (col. 6, lines 16-19) and processing each shifted matrix with a point calculation algorithm to produce a point for each column in each shifted matrix (col. 4, lines 56-58 and Equation 7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Blevins to include shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the data for each variable signal and processing each shifted matrix with a point calculation algorithm to produce a point for each column in each shifted matrix to produce real time solutions to input signals (col. 2, lines 26-30).

3. As per claim 2, Blevins as set forth above teaches the filter is a 1-D filter (col. 10, lines 17-19).
4. As per claim 3, Blevins as set forth above teaches the filter is a time series approximator (col. 10, lines 17-19).
5. As per claim 4, Blevins as set forth above teaches the filter is an n-D filter (col. 10, lines 17-19).
6. As per claim 5, Blevins as set forth above teaches the variable signal estimator is a neural network (col. 6, lines 44-49).
7. As per claim 7, Blevins does not expressly teach the point calculation algorithm averages the values of each column in a given matrix to produce a point for each column in each shifted matrix.

Cheng teaches to the point calculation algorithm averages the values of each column in a given matrix to produce a point for each column in each shifted matrix (col. 4, lines 56-58 and Equation 7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Blevins to include a point calculation algorithm which averages the values of each column in a given matrix to produce a point for each column in each shifted matrix to produce real time solutions to input signals (col. 2, lines 26-30).

8. As per claim 8, Blevins as set forth above teaches the lag estimator is a neural network (col. 6, lines 44-49).

9. As per claim 9, Blevins teaches a method for controlling a controlled operation by determining a lag in measured data from at least one variable signal, comprising:

arranging the data in matrices with one column for each variable signal (col. 9, lines 55-58 and Fig. 3, element 53);

processing data with a variable signal estimator to output a variable signal function for each variable signal that defines each variable signal in terms of its mathematical dependencies on all of the variable signals (col. 10, lines 6-9 and 43-48);  
and

processing each variable signal function with a criterial function to provide an optimal lag value for each variable signal (col. 9, lines 66-67, col. 10, lines 1-3, col. 12, lines 65-67 and col. 13, lines 1-10).

Blevins does not expressly teach shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal.

Chang teaches to shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal (col. 6, lines 16-19).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Blevins to include shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal to produce real time solutions to input signals (col. 2, lines 26-30).

10. As per claim 10, Blevins as set forth above teaches the variable signal estimator is a neural network (col. 6, lines 44-49).

11. As per claim 12, Blevins teaches a method for controlling a controlled operation by determining the lag in measured data from at least one variable signal, comprising:  
arranging the data in matrices with one column for each variable signal (col. 9, lines 55-58 and Fig. 3, element 53);



processing data with a variable signal estimator to output a variable signal function for each variable signal that defines each variable signal in terms of its mathematical dependencies on all of the variable signals (col. 10, lines 6-9 and 43-48);

processing each variable signal function with a criterial function to provide an optimal lag value for each variable signal (col. 9, lines 66-67, col. 10, lines 1-3, col. 12, lines 65-67 and col. 13, lines 1-10);

processing data with a lag estimator to output a lag function for each lag, each lag function defining each lag in terms of its mathematical dependency on all of the variable signals (col. 13, lines 30-38).

Blevins does not expressly teach shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal; and processing each shifted matrix with a point calculation algorithm to produce a point for each column in each shifted matrix.

Chang teaches to shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal (col. 6, lines 16-19); and processing each shifted matrix with a point calculation algorithm to produce a point for each column in each shifted matrix (col. 4, lines 56-58 and Equation 7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Blevins to include shifting the columns of the matrices to produce a plurality of different shifted matrices, each shifted matrix having a given value for the lag in data for each variable signal; and processing each shifted matrix with a point calculation algorithm to produce a point for each column in each shifted matrix to produce a point for each column in each shifted matrix to produce real time solutions to input signals (col. 2, lines 26-30).

12. As per claim 13, Blevins as set forth above teaches the variable signal estimator is a neural network (col. 6, lines 44-49).

13. As per claim 15, Blevins does not expressly teach the point calculation algorithm averages the values of each column in a given matrix to produce a point for each column in each shifted matrix.

Cheng teaches the point calculation algorithm averages the values of each column in a given matrix to produce a point for each column in each shifted matrix (col. 4, lines 56-58 and Equation 7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Blevins to include the

Art Unit: 2121

point calculation algorithm averages the values of each column in a given matrix to produce a point for each column in each shifted matrix to produce a point for each column in each shifted matrix to produce real time solutions to input signals (col. 2, lines 26-30).

14. As per claim 16, Blevins as set forth above teaches to the lag estimator is a neural network (col. 6, lines 44-49).

15. As per claim 17, Blevins teaches a method for determining a lag in measured data from a variable signal, comprising:

filtering the measured data (col. 4, lines 29-34, col. 10, lines 13-16 and Fig. 3, element 60);

arranging the measured data into matrices, including one column for each variable signal (col. 9, lines 55-58 and Fig. 3, element 53);

processing each variable signal function with a criterial function to produce an optimal lag value for each variable signal (col. 9, lines 66-67, col. 10, lines 1-3, col. 12, lines 65-67 and col. 13, lines 1-10);

processing each lag value and each optimal lag value with lag estimator to output lag function for each lag (col. 13, lines 30-38); and

determine its goodness of fit for each lag function (col. 17, lines 4-16).

Blevins does not expressly teach to producing a plurality of shifted matrices with a value for the lag data for each variable signal; processing each shifted matrix to output a variable signal function for each variable signal; and processing each shifted matrix with a point calculation algorithm to produce a lag value for each column in each shifted matrix.

Chang teaches producing a plurality of shifted matrices with a value for the lag data for each variable signal (col. 6, lines 16-19); processing each shifted matrix to output a variable signal function for each variable signal (col. 6, lines 16-19); and processing each shifted matrix with a point calculation algorithm to produce a lag value for each column in each shifted matrix (col. 4, lines 56-58 and Equation 7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Blevins to include producing a plurality of shifted matrices with a value for the lag data for each variable signal; processing each shifted matrix to output a variable signal function for each variable signal; and processing each shifted matrix with a point calculation algorithm to produce a lag value for each column in each shifted matrix to produce real time solutions to input signals (col. 2, lines 26-30).

16. Claim 6, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blevins in view of Chang in further view of U.S. Patent 4,349,869 (hereinafter Prett).

17. As per claim 6, Blevins and Chang do not expressly teach the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal.

Prett teaches to a criterial function utilizes optimization methods to provide an optimal value for each variable signal (col. 8, lines 2-7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Blevins in view of Chang to include a criterial function utilizing optimization methods to move the controlled variable towards its optimum setpoint and to predict where the process is going, and to compensate in the present moves to control any further problems (col. 3, lines 5-11).

18. As per claim 11, Blevins and Chang do not expressly teach the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal.

Prett teaches to the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal (col. 8, lines 2-7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Blevins in view of Chang to include the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal to move the controlled variable towards its optimum setpoint and to predict where the process is going, and to compensate in the present moves to control any further problems (col. 3, lines 5-11).

19. As per claim 14, Blevins and Chang do not expressly teach the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal.

Prett teaches to the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal (col. 8, lines 2-7).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Blevins in view of Chang to include the criterial function utilizes optimization methods to provide an optimal lag value for each variable signal to move the controlled variable towards its optimum setpoint and to predict where the process is going, and to compensate in the present moves to control any further problems (col. 3, lines 5-11).

***Response to Arguments***

20. Applicant's arguments, see Remarks pgs. 7-8 filed 25 September 2006 with respect to the rejection of claim(s) 1-16 under 35 U.S.C. 103 (a) have been fully considered but they are not persuasive.

21. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Chang discloses (col. 2, lines 26-30) "... a final output signal is delivered from the systolic processing array which output signal is a real-time solution to the input signals...".

22. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "actual variables") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Hence, the use of "response curves" as a "variable signal" meets the

Art Unit: 2121

claimed limitation of "variable signals", thus Blevins in view of Chang meets the claimed limitation.

23. In response to applicant's argument that Blevins and Chang is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Chang and Blevins both relate to the adaptation of process inputs.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to the transformation of data.

U.S. Patent Publication No. 2006/0020428 discloses a method of decoorelation signals comprising processing inputs signals to determine delay ad rotation parameters.



U.S. Patent No. 5,511,037 discloses the transformation of measurement data using filter sensor resolution matching and depth shifting techniques.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2121

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Anthony Knight  
Supervisory Patent Examiner  
Art Unit 2121